



Norman H. Bangerter  
Governor

Dee C. Hansen  
Executive Director

Dianne R. Nielson, Ph.D.  
Division Director

# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

355 West North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203  
801-538-5340

September 8, 1992

TO: Board of Oil, Gas and Mining

THRU: Lowell P. Braxton, Associate Director, Mining *LPB*

THRU: D. Wayne Hedberg, Permit Supervisor *DWH*

FROM: Anthony A. Gallegos, Reclamation Engineer *aaG*

RE: Request for Board Concurrence/Approval, Amount and Form of Reclamation Surety, Kennecott Corporation, Barney's Canyon Mine - Permit Revision, M/035/009, Salt Lake County, Utah

Attached for your information is a copy of an Executive Summary, Reclamation Surety Estimate, draft Reclamation Contract and Surety Bond for Kennecott's Barney's Canyon Mine. Kennecott has filed a permit revision application to expand the scope of their existing gold mining project which the Division tentatively approved on September 8, 1992. A public notice has been forwarded to the appropriate newspaper services initiating a 30-day public comment period that should expire on or about October 10, 1992.

Kennecott is presently acquiring a replacement surety bond from Safeco Insurance Company in the amount of \$3,020,000. This surety will cover the estimated decommissioning and reclamation costs associated with this open pit gold mining and cyanide heap leaching project. The new replacement surety bond will be available for your review during the executive session of the September Board hearing. Following the Board's approval of the amount and form of replacement surety, and subsequent expiration of the 30-day public comment period, the Division will be prepared to forward its final approval notice to Kennecott for this permit revision.

Thank you for your time and consideration of this request.

jb  
Attachments  
M035005.brd

# DOGM MINERALS PROGRAM

## Check List for Board Approval of FORM and AMOUNT of SURETY

Mine Name: Barney' Canyon Mine

File Number: M/035/009

Item	Provided		
	Yes	No	
Executive Summary	X		
Location Map	X		
Reclamation Bond Estimate	X		Revision of previous surety estimate
Signed Reclamation Contract		X	Forthcoming - Draft copy enclosed
Signed Power of Attorney/ Affidavit of Qualification		X	Forthcoming - Draft copy enclosed
Bond		X	Actual bond in place by time of hearing
Surety Sign off (Other State/Federal Agencies)		X	N/A



## Executive Summary

Last revised September 1, 1992

**Mine Name:** Barney's Canyon Mine - Permit Revision/Expansion **I.D. No:** M/035009  
**Operator:** Kennecott Corporation **County:** Salt Lake  
P.O. Box 311 **New/Existing:** Existing (original  
Bingham Canyon, UT. 84006-0311 approval 1989)  
**Telephone:** (801) 569-7200 **Mineral Ownership:** Private  
**Contact Person:** David I. Hodson, General Manager **Surface Ownership:** Kennecott  
**Lease No.(s):** N/A  
**Permit Term:** Life of Mine  
**Life of Mine:** 8 years (based upon present ore reserves)

**Legal Description:** Project Expansion will impact lands located within: Township 3 South,  
Range 3 West, Sections 1, 2, 3, 10, and 11.

**Mineral(s) to be Mined:** Gold, Silver

**Mining Methods:** Open Pit Mining - Cyanide Heap Leach Operation

**Acres to be Disturbed:** 707 acres approved (1989), @218 new acres (revision), total 925  
acres, @770 acres will be reclaimed.

**Present Land Use:** Wildlife Habitat, surface mining, mineral processing and mineral  
exploration activities.

**Postmining Land Use:** Wildlife Habitat and Livestock Grazing

### Soils and Geology:

**Soil Description:** All of the soils are very gravelly and/or cobbly. Textures range from  
loams to silt or clay loams to silty clays, organic matter above 1%.

**Variances from Reclamation Standards (Rule R647) Granted:** R647-4-107.5 (Soils),  
R647-4-111.6 (Slopes), R647-4-111.7 (Highwalls), R647-4-111.12 (Topsoil  
Redistribution), and R647-4-111.13 (Revegetation).

**pH:** 5.78 - 7.73

**Special Handling Problems:** Phosphorus is deficient, moderate to high erosion potential,  
some shallow soils on steep terrain cannot be safely removed and stockpiled.

**Geology Description:** Project area located east edge of Paleozoic core of Oquirrh Mtns.  
Barneys Cyn. deposit occurs in Permian dolomite of Park City Formation and underlying  
calcareous sandstone of Permian Kirkman-Diamond Creek Formation. Melco deposit  
occurs in Permian calcareous sandstones of Kirkman-Diamond Creek Formation and  
underlying orthoquartzite of Freeman Peak Formation. The BC South deposits are hosted



in Kirkman-Diamond Creek Sandstone near contact with orthoquartzites of underlying Freeman Peak Formation. Gold mineralization hosted in moderately dipping, clay-rich zones of slip and brecciation within interlayered sandstone and orthoquartzite.

### **Hydrology:**

**Ground Water Description:** Overall project area is located in a general recharge area for underlying aquifers. Depth to the confined bedrock aquifer in project processing facilities area is approximately 165 feet. Depth to local water table in area of Melco pit is estimated at 6826 feet AMSL, @50 feet below final Melco pit depth. The local water table in vicinity of proposed BC South pits is estimated at 6200 to 6400 feet AMSL. Final pit depths for the North BC South and South BC South pits are 6475 and 6575 feet AMSL, respectively. Exploration drilling identified a localized zone of perched water adjacent to location of the South BC South pit. Proposed pit design makes interception of the perched water zone(s) unlikely.

**Surface Water Description:** Barney's Creek is intermittent to perennial (2 mi. reach), is adjacent to the process facilities area and drains into Jordan River. Other small, intermittent and ephemeral drainages in the project area of minimal flow. One spring is located in general area (Bancroft Spring).

**Water Monitoring Plan:** To be determined by the State Department of Environmental Quality, Division of Water Quality pursuant to Ground Water Discharge Permit.

### **Ecology:**

**Vegetation Type(s); Dominant Species:** North slope/Conifer-Shrub Community, Riparian Community, Oak Woodland/Mountain Brush Community, Shrub Oak/Big Sagebrush Community and Big Sagebrush Community.

**Percent Surrounding Vegetative Cover:** Cover varies depending on community type and ranges from 50 - 70%.

**Wildlife Concerns:** Some temporary losses of deer and elk winter range until ultimate reclamation and successful revegetation occurs.

**Surface Facilities:** Barney's Canyon, Melco, North and South BC South pits, associated mine dumps, haul/access roads, processing plant site - includes ore crushing and agglomerating plant, several heap leach pads, a leachate processing plant and refinery, processing solution ponds, and associated processing facilities.



## **Mining and Reclamation Plan Summary: . . . .**

### During Operations:

1. Typical open pit mining operations of 2 existing pits and 2 new pits. Mined ore is hauled by truck from the open pits to the processing plant site. Waste is hauled to designated waste dump areas. Ore is crushed and agglomerated and stacked upon lined heap leach pads equipped with leak detection monitoring systems. Precious metals are leached with a weak cyanide solution, precipitated in the processing plant, then refined into dore bars.
2. The principal existing project components are the Barney's and Melco open pit mines, related mine waste dumps and processing plant. The processing plant consists of an ore crushing and agglomerating plant, several heap leach cells, a leachate processing plant and refinery, offices and shops.

This project expansion/revision will not change any of the existing facilities except for an expansion in the size of the Melco pit, and the development of the South BC South and North BC South pits and their associated waste dumps.

3. Approximately 1,000,000 cubic yards of topsoil will be salvaged and stockpiled for final reclamation of disturbed areas.
4. Mining commenced in 1989 and is anticipated to continue through 1997. The heap leaching operation will be operated for approximately one year after mining has ceased. Reclamation activities will commence concurrently with the cessation of mining operations.

### After Operations:

1. Leach pads and ponds will be decommissioned, graded, topsoiled and revegetated.
2. Pit highwalls will not be reclaimed. Accessible pit benches will be revegetated. The South BC South pit will be partially backfilled with waste from North BC South pit. Waste dumps will be revegetated.
3. The primary sedimentation pond and South BC impoundment will be left for livestock and wildlife grazing.
4. The majority of the remaining disturbed areas will be graded, topsoiled, and revegetated.



**Surety :**

**Amount:** \$3,020,000 (1997 dollars)  
**Form:** Surety bond (Safeco Insurance Company of America)  
**Renewable Term:** 5 years - 1997

# BARNEYS CANYON PROJECT

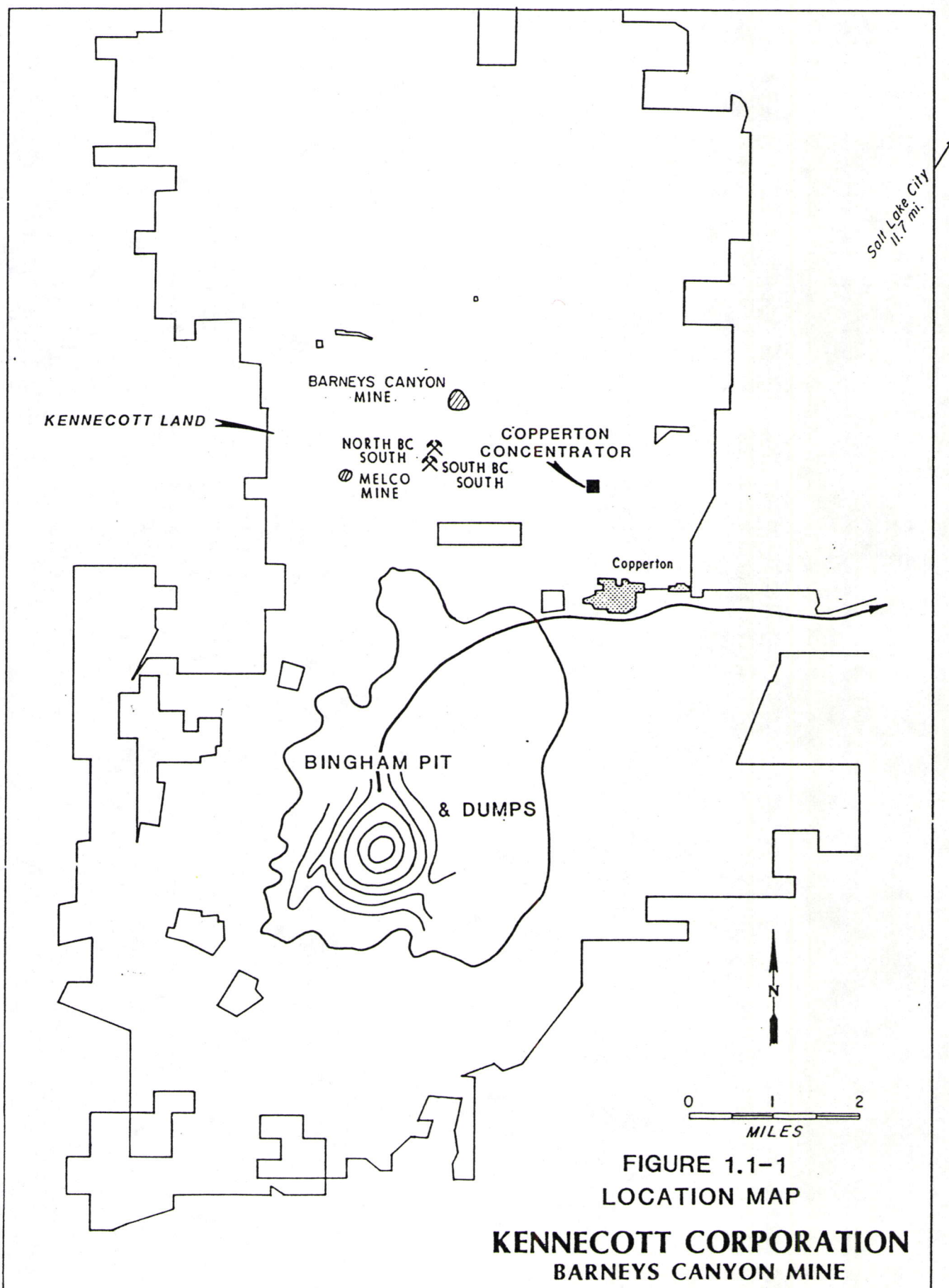


FIGURE 1.1-1  
LOCATION MAP

**KENNECOTT CORPORATION**  
**BARNEYS CANYON MINE**



# SURETY ESTIMATE REVISION

Kennecott Utah Copper

M/035/009

Barneys Canyon Mine

Salt Lake County, Utah

Prepared by Utah Division of Oil, Gas & Mining

Last Update

09/08/92

## DESCRIPTION:

-This estimate is based on the REVISION preliminary version received 8/28/92

-Reclamation estimate originally calculated in 1988-\$ = \$2,206,340

-Original estimate in 1988-\$ for 629.7 "Reclaimed Acres"

-Surety was posted in 1988 for \$2,700,000 in 1993-\$

-Escalation factors through 1991 are actual Means Historical Cost Indices

Escalate the original surety amount calculated to current dollars (1992)

CALCULATIONS	YR	ESCAL FACTOR	BOND AMOUNT	
$F = P(1 + i)^{**n}$	1988	0.0181	\$2,206,340	
F = Future Sum	1989	0.0177	\$2,245,392	
P = Present Sum	1990	0.0077	\$2,262,682	
i = Escalation Factor	1991	0.0127	\$2,291,418	
n = number of periods	1992	0.0127	\$2,320,519	
"Reclaimed Acreage" (1988 NOI) =			629.7	TOTAL
\$ per "Reclaimed Acre" in 1992-\$ =			\$3,685	"RECLAIMED ACREAGE"
"Reclaimed Acreage" in revision =			139.8	=> 769.5
Multiplied by \$/"Reclaimed Acre" 1992-\$ =			\$515,179	
Add to 1992-\$ to get new total =			\$2,835,698	

Escalate this new total 5 years into the future

CALCULATIONS	YR	ESCAL FACTOR	BOND AMOUNT
$F = P(1 + i)^{**n}$	1992	0.0127	\$2,835,698
3 Yr Average = 1.27%	1993	0.0127	\$2,871,712
Used to Project 5 Yrs	1994	0.0127	\$2,908,182
Into the Future	1995	0.0127	\$2,945,116
From the Year 1992	1996	0.0127	\$2,982,519
	1997	0.0127	\$3,020,397

Updated Surety Amount Rounded (1997-\$) \$3,020,000  
Average cost per reclaimed acre 3,925 (\$/ACRE)